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US Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555
Attention: Alexander Adams, Project Manager
Office of Nuclear Reactor Regulation
Research and Test Reactors Branch

Re: Docket 50-326. Incident report:
Irrigation water incursion to fresh fuel in storage.

Description of incident:

During the weekend of August 12-13th 2006, an irrigation valve failure caused surface and underground flooding of the area adjacent to Rowland Hall which houses the UCI TRIGA reactor. Following report of the valve failure early Monday morning (August 14th), two of five below ground storage pits inside the facility to which an EH&S staff member had immediate access were inspected and found to be dry. Those pits were used for radioisotope source storage. Later in the day, approximately 6 inches depth of the water was found in two of the other pits. Water was found to be at a level of 10' 9" below floor level in an observation pit in the facility. The other three (of five pits) pits remain in perfectly dry condition.

One of the "wet" storage pits was in use to store 3 fresh (unused) fuel entities (1 standard element, 1 thermocouple element, and 1 fuel follower control rod). These were contained in cardboard "mailing tubes" and arranged vertically in a metal cage standing on the bottom of the pit. The cardboard tubes had become water saturated and were peeling from the elements. The steel end caps of the tubes were rusting.

Upon discovery, these elements were cleaned from any adhering cardboard material, wiped clean and dry, and placed in alternative (above ground) locked storage. Three additional elements in an adjacent pit which had remained dry were also removed to the above ground storage to avoid any further problems. No sign of any corrosion or other problems were noted on the stainless steel cladding or end pins of the elements.

Current, ongoing, actions.

A sump pump installed (see below) some years ago (1974-75) to mitigate such problems was restarted on Tuesday (August 15th). The pump had been

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disabled/disconnected owing to current seismic upgrade construction activities in the building loading dock area.

All removed items from the pits, cleaning towels, etc, and water samples are being assayed for potential radioactive contamination by gamma spectrometry and beta counting (LSC). So far no contamination is indicated, but long counting periods and background comparisons are being employed to provide assurance.

Past events and past mitigation


In November 1974, a similar occurrence enhanced by rainfall had a similar result. At that time, it was discovered that the resulting water had accumulated at a higher than usual table level (up to 8 feet) beneath Rowland Hall.

Concerns were expressed regarding such water reaching the reactor tank itself, and NRC visits were made to discuss alternatives. Reasonable assurance was accepted that the reactor tank was well protected against outer corrosion, but two mitigation measures were instituted:

1. Drilling of a "sump" pit to approximately the same depth (40-45 feet) adjacent to the loading dock and installation of a "sump pump" actuated by high water level, to pump out ground water from future incursions. This pump has been inspected annually to assure continuing operational status. [Years later, a second sump and pump has been installed adjacent to an opposite corner of the building to deal with water on that side of the building that was entering a pit utilized by a faculty member doing highly sensitive gravity research.]
2. Drilling of an "observation pit" with a 35 foot plastic tube liner within the facility to monitor water conditions below the building. Normal water level was identified in this pit as greater than 30 feet below floor level.

These measures have apparently functioned satisfactorily to this date. Discussions are ongoing about additional measures that could be implemented.

The above descriptions are provided for information only. It is not anticipated that this incident will have any impact on the continued safe operation of the reactor. It should be made abundantly clear that none of this water is from any part of the reactor pool and that contact has been observed only with three fresh, unused, fuel elements. Any further developments, including a final report on ongoing assay measurements will be provided in due course.



George E. Miller
Reactor Supervisor